



**East
Arapahoe**
Transportation Plan

Community Working Group Meeting #3

August 3, 2016



**N NELSON
NYGAARD**

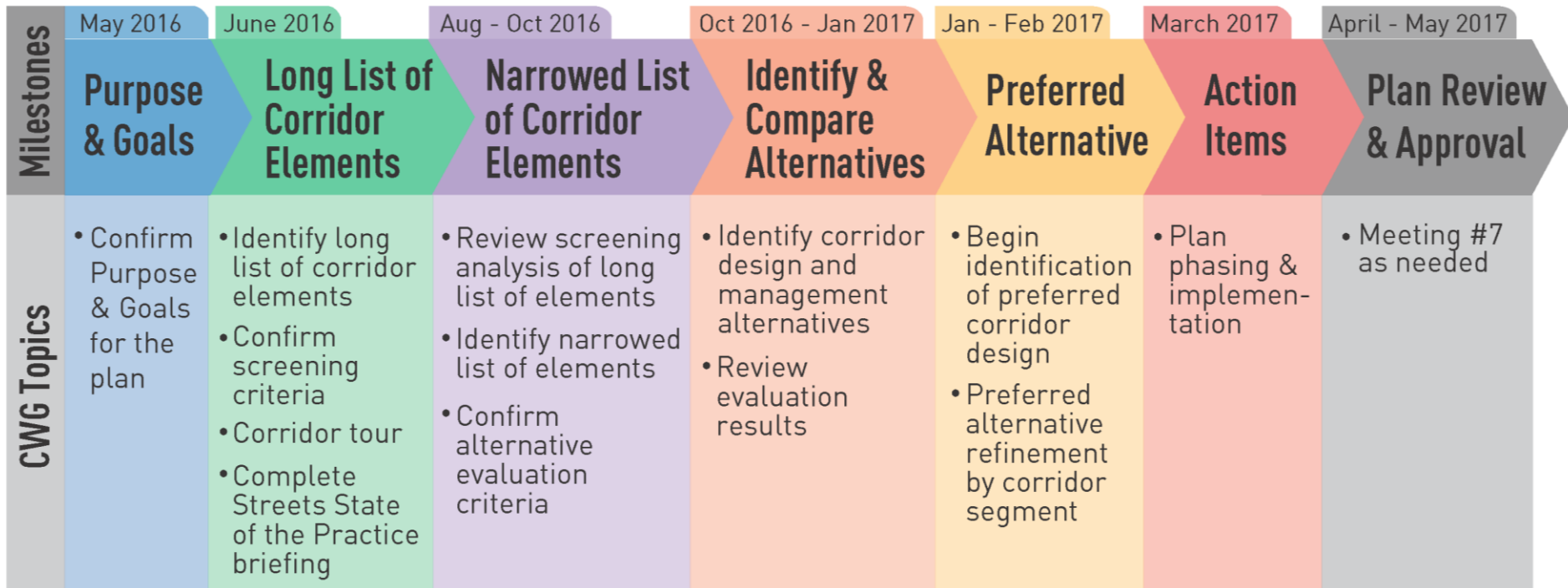
FOX TUTTLE HERNANDEZ
TRANSPORTATION GROUP

FEHR & PEERS

Meeting Agenda

- Welcome
- Background
 - Corridor Elements Screening Process
 - Polling Exercise/Discussion Approach
- Corridor Elements Polling Exercise
 - Bike/Pedestrian/Streetscape
 - Transit/TDM
 - Vehicular
- Debrief and Next Steps

Project Schedule



INITIAL SCREENING OF CORRIDOR ELEMENTS

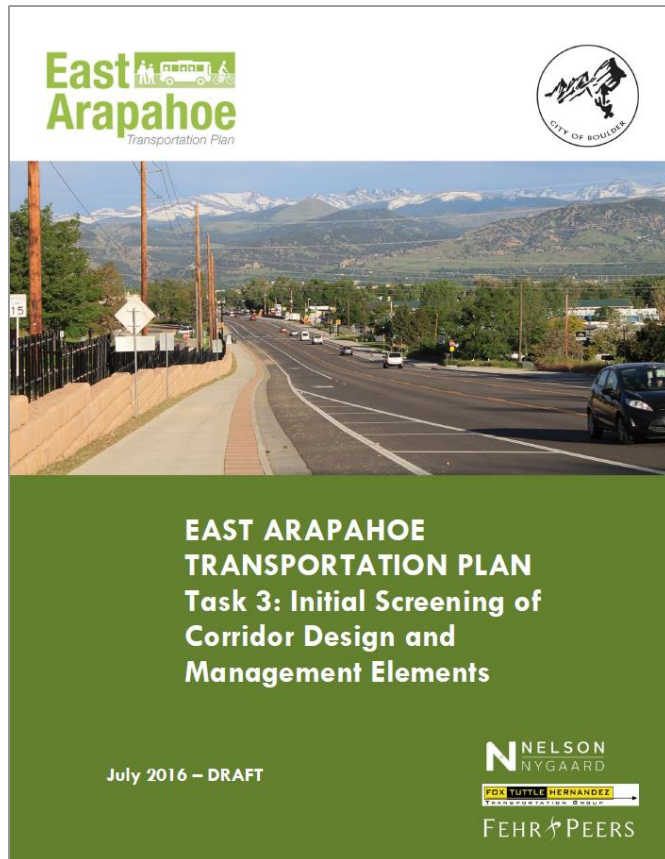
Purpose of Initial Screening

- Eliminate design & operational elements that:
 1. Are not aligned with the Plan Purpose and Goals
 2. Are not feasible based on design or cost limitations
 3. Pose safety hazards to roadway users

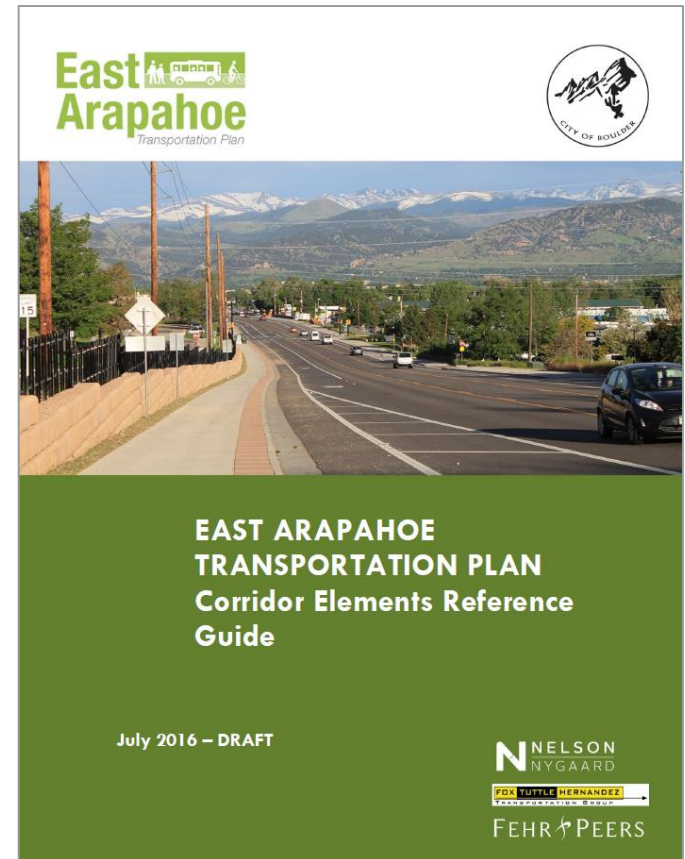
- Elements that do not meet criteria are recommended to be:
 - Removed from consideration
 - Use only in limited application

CWG Materials

- Initial Screening Memo
 - Summarizes project team assessment and recommendations



- Corridor Elements Reference Guide
 - Describes corridor elements and design options



Screening Criteria: EATP Purpose and Goals

Supports purpose and goals of the East Arapahoe Transportation Plan.

Tests:

- Does not advance design or operation of a Complete Street offering users a variety of safe and reliable travel choices
- Does not increase the number of person trips the corridor can carry
- Does not advance/promote efficient use of transportation system and offer enhanced travel options
- Does not deliver cost-effective solutions that can be phased over time
- Does not support Boulder's Sustainability Framework (safety, health, livability, accessibility & connectivity, sustainability, economic vitality, good governance)

Screening Criteria: Design Feasibility and Cost

Can be designed/constructed without significant impacts to corridor users, adjacent property or people, and at reasonable cost relative to benefits.

Tests:

- No reasonable demonstration of technical feasibility.
- No comparable projects built.
- Creates significant adverse environmental impacts.
- Cost per user served (or user benefit) out of line compare to built projects.
- Not responsible use of limited public funds.

Screening Criteria: Safety

Likely to have negative impacts on safety for any mode or user.

Tests:

- Reduces safety for corridor users.
- Results in specific safety hazards.
- Inhibits emergency vehicle access.

Screening Criteria: Scoring Results

- Each element rated for the three criteria and overall:
 - Feasible or supportive: recommended to be moved forward to next stage of evaluation
 - ▲ Challenging, cause for concern, or only appropriate in certain locations
 - ✗ Infeasible, significant impacts, or not supportive
- Elements not rated as “feasible or supportive” recommended to be:
 - Removed from consideration
 - Considered only for limited application

POLLING EXERCISE

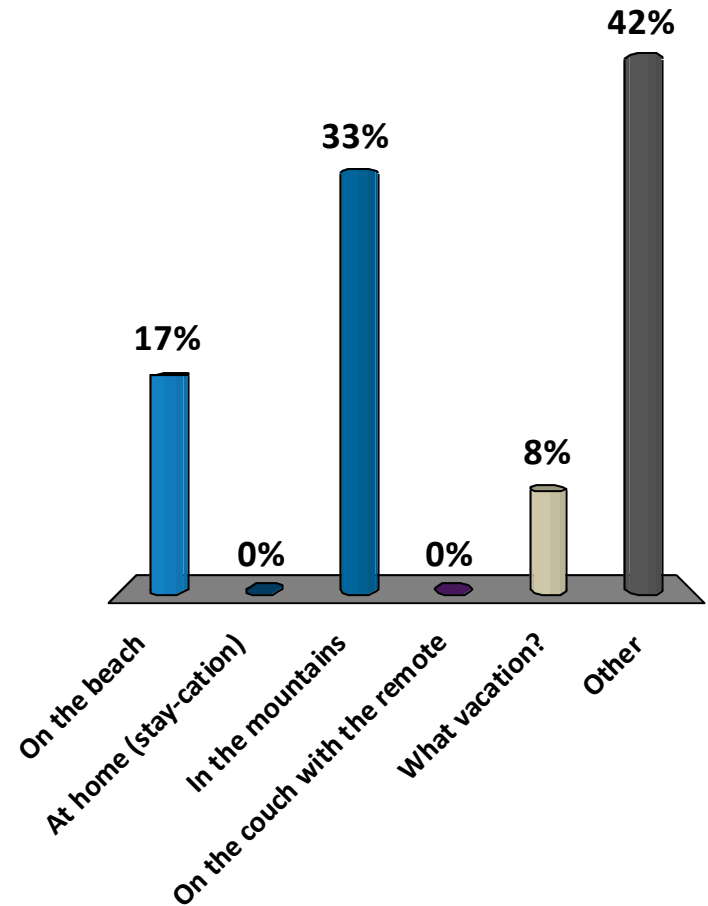
Polling Exercise

- Purpose: Allow CWG to confirm project team's initial screening of corridor elements or identify need for further discussion or analysis in next stage of evaluation
- For each category of elements:
 - **Recap** recommendation and rationale
 - **Preliminary voting** on elements recommended for removal or limited use: Do you agree with the screening results and recommendation?
 - A. Yes
 - B. No
 - C. Neutral
 - D. Need more information
 - **Discussion**
 - **Follow-up voting**

Warm-Up Polling Exercise

Where would you prefer to spend your vacation?














- A. On the beach
- B. At home (stay-cation)
- C. In the mountains
- D. On the couch with the remote
- E. What vacation?
- F. Other





PEDESTRIANS, BICYCLING, AND STREETScape

Pedestrians, Bicycling and Streetscape


Carried Forward	Limited Use	Eliminated
<p> S1 Additional Crossings</p> <p> S2 Intersection Enhancements</p> <p> S3 Multi-Use Path</p> <p> S4 Enhanced Multi-Use Path</p> <p> S7 Buffered Bicycle Lanes</p> <p> S8 Protected Bicycle Lanes</p> <p> S10 Amenity Zone Features</p> <p> S11 Landscaping</p> <p> S12 Public Art</p> <p> S13 Gateway Features</p>	<p> S5 Shared travel lanes with pavement markings</p> <p> S6 Bike Lanes</p>	<p> S9 Shared Bus and Bike Lanes</p>

Preliminary Response: Bicycle/Pedestrian/Streetscape

Do you agree with the recommendation to **remove** or **limit the use of** each of the following elements from further consideration?

S5: Shared Travel Lanes with Pavement Markings



Score	Rationale	Recommendation
	Traffic speed; would not broaden appeal of bicycling to people of all ages and abilities (Objective 1.c)	Use in limited circumstances. Could be allowed where no alternatives exist or where right-of-way is limited.



Feasible or supportive



Challenging, cause for concern, or only appropriate in certain locations

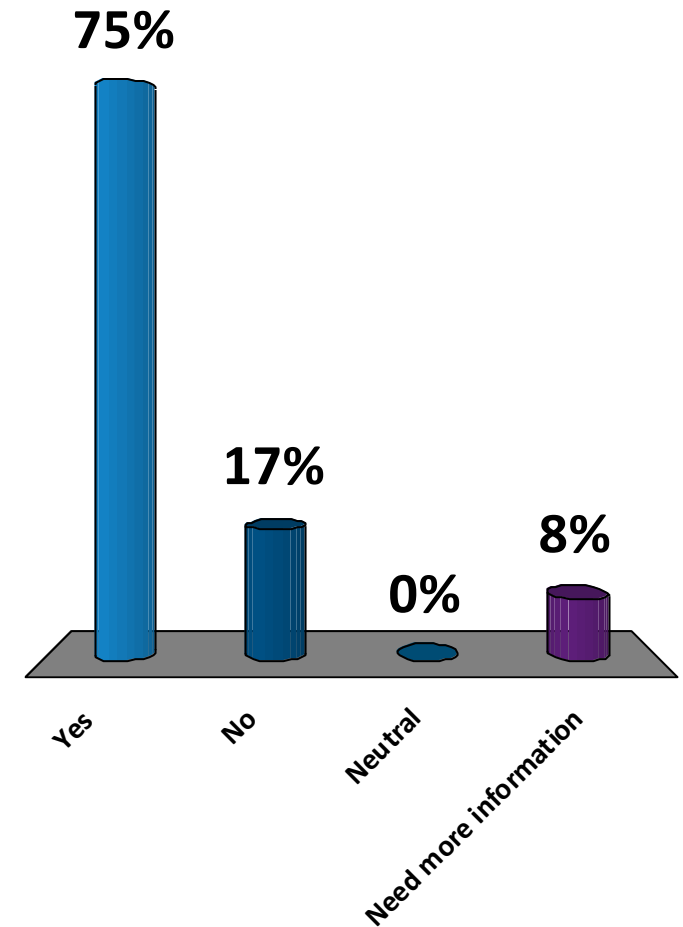


Infeasible, significant impacts, or not supportive

S5: Shared Travel Lanes with Pavement Markings


Do you agree with the recommendation to **limit the use of** this element?

- A. Yes
- B. No
- C. Neutral
- D. Need more information



S6: Bike Lanes (Standard)

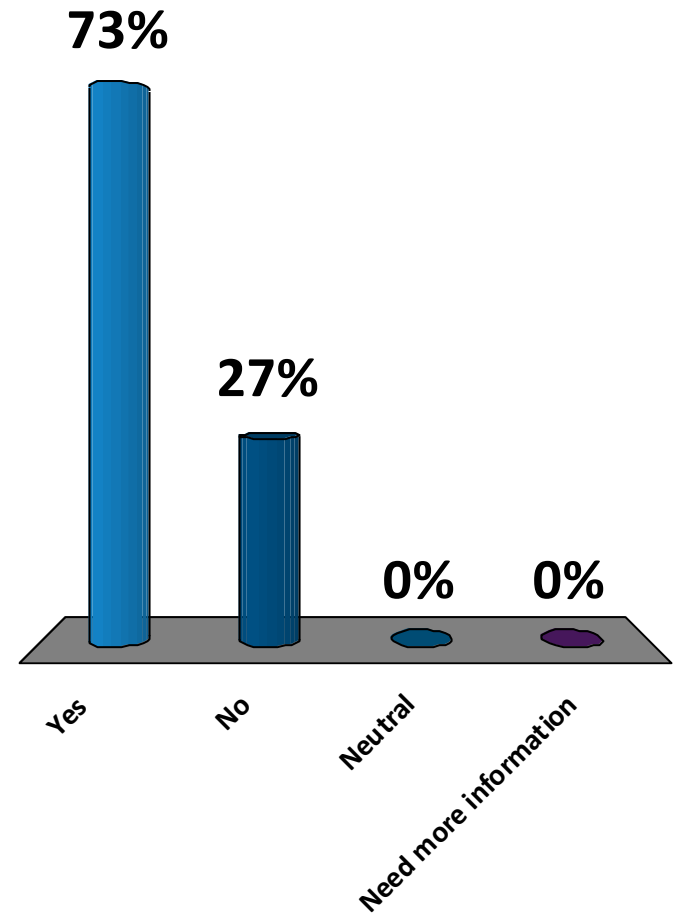


Score	Rationale	Recommendation
	Given speed and traffic volumes on Arapahoe, buffered or protected lanes are preferred	Use in limited circumstances – when buffered or protected lanes are not feasible

S6: Bike Lanes (Standard)

Do you agree with the recommendation to **limit the use of** this element?

- A. Yes
- B. No
- C. Neutral
- D. Need more information



S9: Shared Bus and Bike Lanes

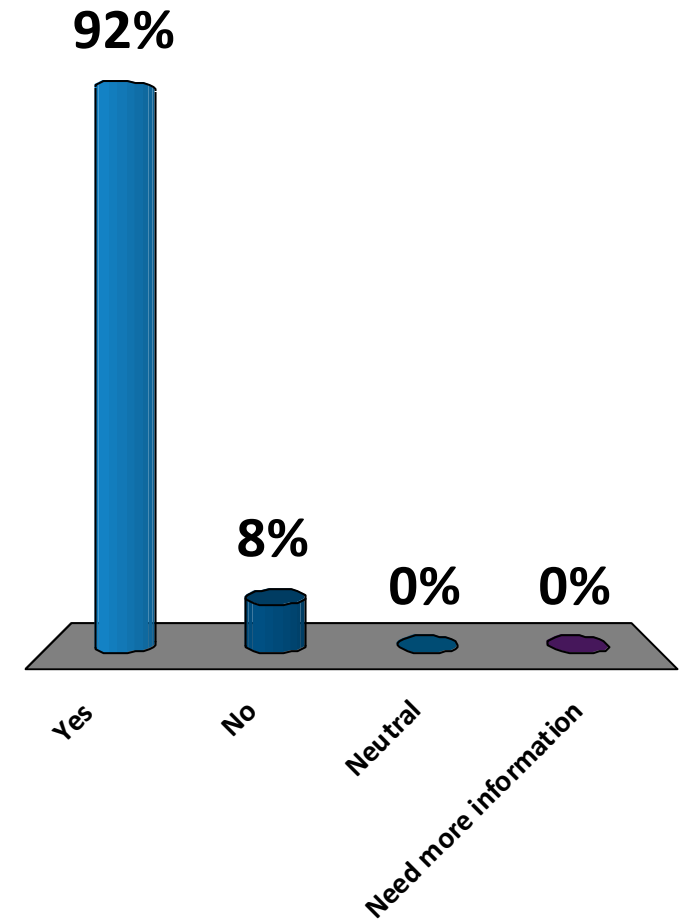


Score	Rationale	Recommendation
✖	Not appropriate for streets with speeds > 35 mph; a single bicyclist can create significant delay for a bus carrying 40 or more passengers	Remove from consideration; May be used in short segments where no alternative exists

S9: Shared Bus and Bike Lanes

Do you agree with the recommendation to **remove** this element from consideration?

- A. Yes
- B. No
- C. Neutral
- D. Need more information



Discussion: Bicycle/Pedestrian/Streetscape



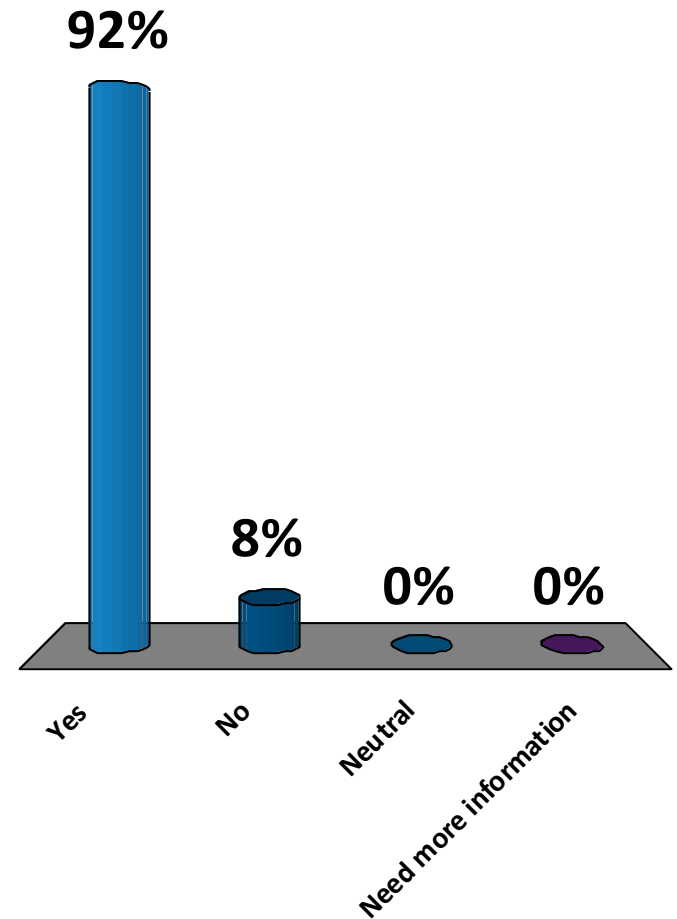
Follow-up Polling: Bicycle/Pedestrian/Streetscape

Do you agree with the recommendation to **remove** or **limit the use of** each of the following elements from further consideration?

S5: Shared Travel Lanes with Pavement Markings

Do you agree with the recommendation to **limit the use of** this element?

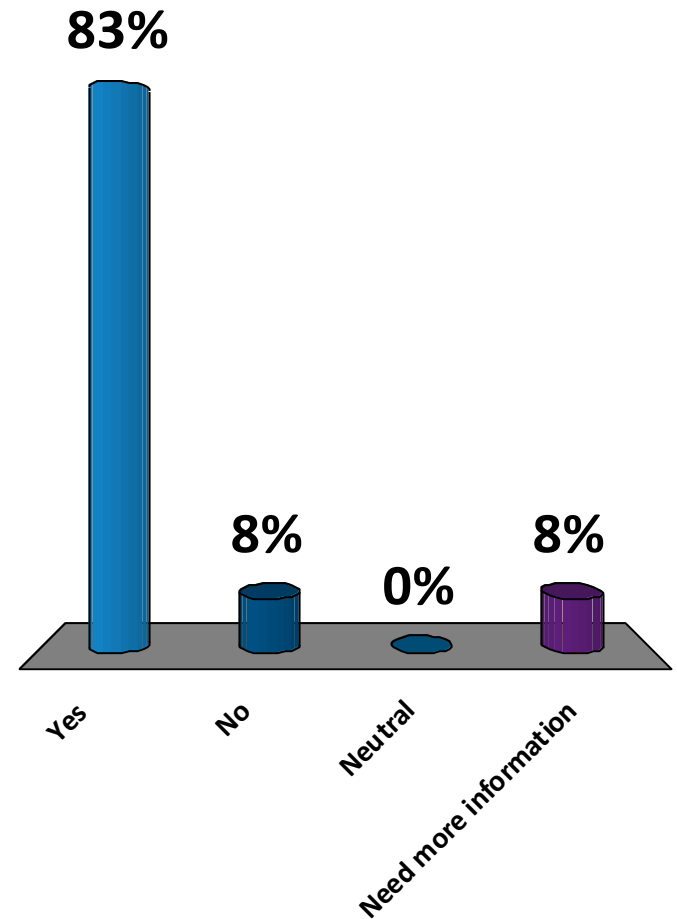
- A. Yes
- B. No
- C. Neutral
- D. Need more information



S6: Bike Lanes (Standard)

Do you agree with the recommendation to **limit the use of** this element?

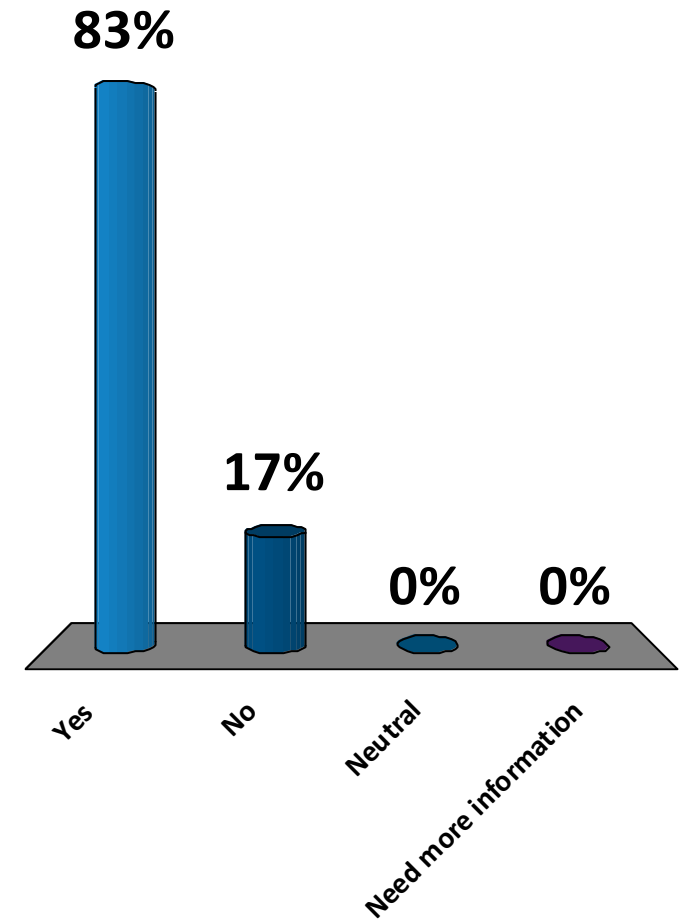
- A. Yes
- B. No
- C. Neutral
- D. Need more information



S9: Bus and Bike Lanes

Do you agree with the recommendation to **remove** this element from consideration?

















- A. Yes
- B. No
- C. Neutral
- D. Need more information






CORRIDOR TRANSIT AND TDM ELEMENTS

Transit and TDM

Carried Forward		Limited Use	Eliminated
 T1 Side-running bus in mixed traffic  T2 Enhanced Bus (without dedicated lanes)  T3 BRT (side-running in BAT or transit lane)  T4 BRT (center-running in dedicated lane)  T8 Peak-only Exclusive Transit Lanes  T9 Better information and timed transfers  T10 Real-time, app-based information  T11 Expanded EcoPass  T13 Improved transit amenities	 T14 Park-and-rides  T15 Parking Management  T16 First/Last-mile connections  T17 Shared use mobility		 T5 Streetcar  T6 Light Rail -- T7 Commuter Rail  T12 Reversible transit lane

 Feasible or supportive  Challenging, cause for concern, or only appropriate in certain locations

 Infeasible, significant impacts, or not supportive

Preliminary Response: Transit/TDM

Do you agree with the recommendation to **remove** or **limit the use of** each of the following transit/TDM elements from further consideration?

T5: Streetcar

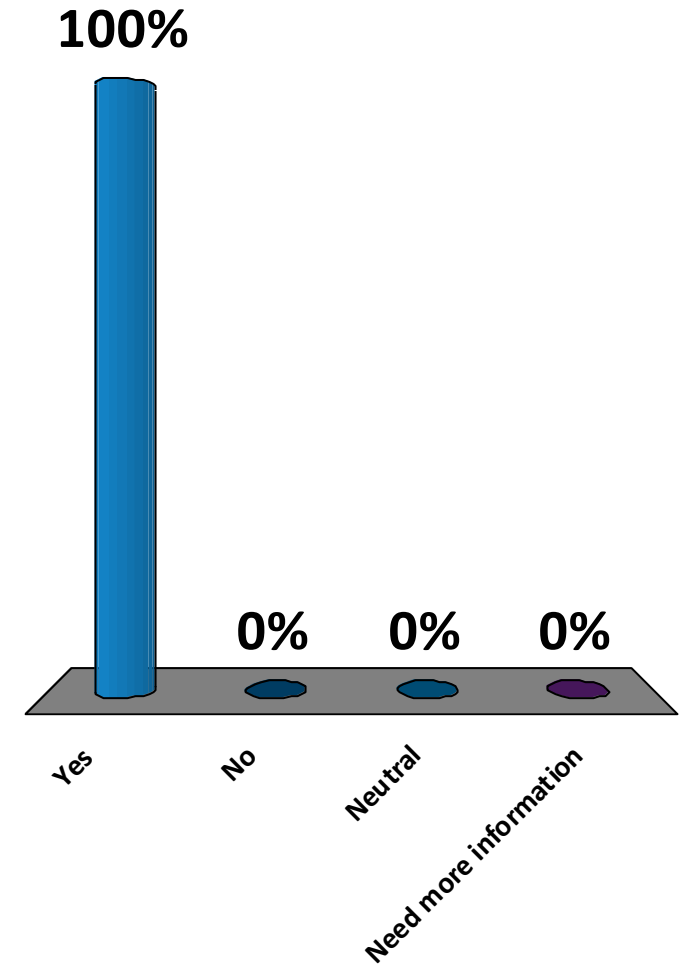


Score	Rationale	Recommendation
✖	Streetcars are meant for local circulation at slow speeds; does not support regional travel (Objective 2.b)	Remove from consideration

T5: Streetcar

Do you agree with the recommendation to **remove** this element from consideration?

- A. Yes
- B. No
- C. Neutral
- D. Need more information



T6: Light Rail Transit

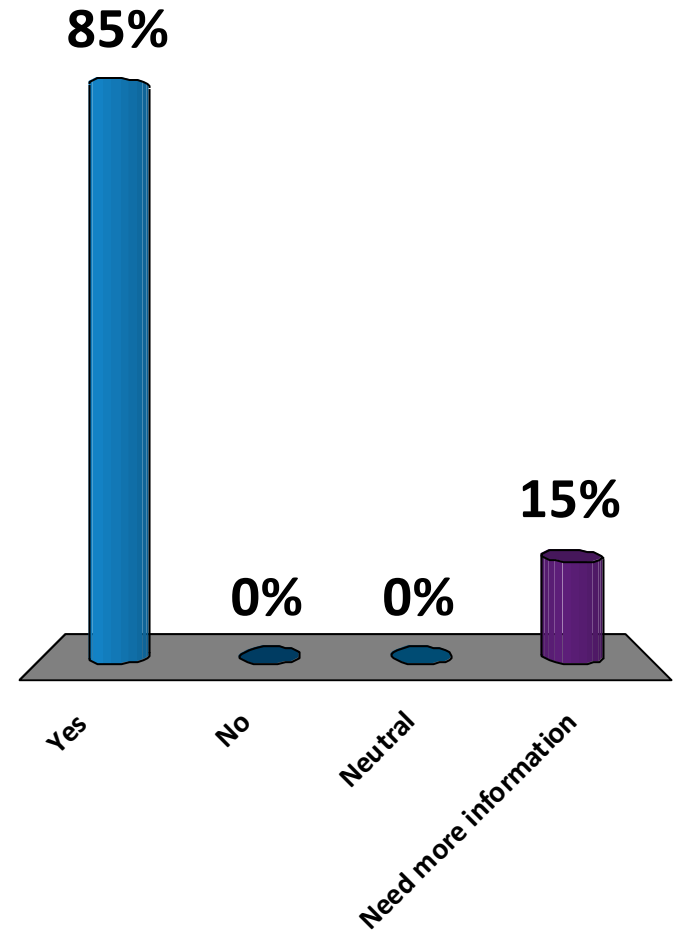


Score	Rationale	Recommendation
✖	Limited utility and likely high cost per rider without regional system	Remove from consideration

T6: Light Rail Transit

Do you agree with the recommendation to **remove** this element from consideration?

- A. Yes
- B. No
- C. Neutral
- D. Need more information



T7: Commuter Rail



Score	Rationale	Recommendation
--	Operates in heavy rail corridor; FRA regulations require gates at grade crossings	Identify RTD Northwest Rail line as a future project



Feasible or supportive



Challenging, cause for concern, or only appropriate in certain locations



Infeasible, significant impacts, or not supportive

T12: Reversible Transit Lane



Score	Rationale	Recommendation
--	Multiple stop locations required in each direction; confusing for passengers; not effective means to serve bi-directional regional travel (Objective 2.b).	Remove from consideration; May be used in short segments to address specific design issues



Feasible or supportive



Challenging, cause for concern, or only appropriate in certain locations

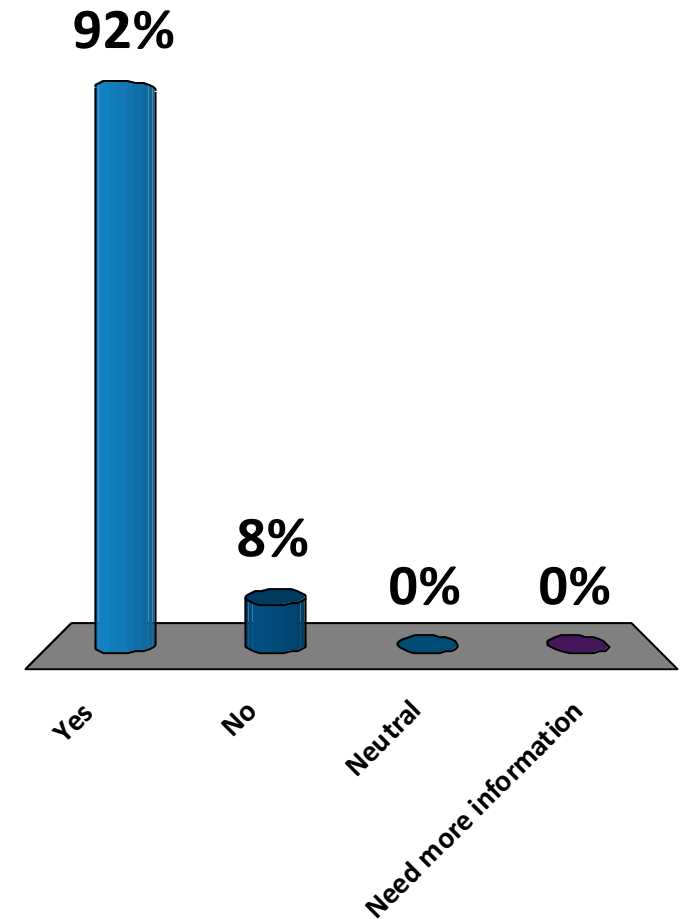


Infeasible, significant impacts, or not supportive

T12: Reversible Transit Lane

Do you agree with the recommendation to **remove** this element from consideration?

- A. Yes
- B. No
- C. Neutral
- D. Need more information



Discussion: Transit/TDM

Transit/TDM is a concept that has been around for a long time, but it has become increasingly relevant in recent years. It is a way of thinking about transportation that focuses on the needs of the community as a whole, rather than just the needs of individual users. This means considering the needs of people who are walking, biking, and using public transit, as well as those who are driving. Transit/TDM is a holistic approach to transportation planning that takes into account the needs of all users and the impact of transportation on the environment and the community.

One of the key benefits of Transit/TDM is that it can help to reduce traffic congestion and improve the efficiency of the transportation system. By encouraging people to use public transit, bike-sharing, and car-sharing, Transit/TDM can help to reduce the number of cars on the road. This can lead to shorter travel times and less time spent stuck in traffic. Additionally, Transit/TDM can help to reduce the environmental impact of transportation by reducing the number of cars and the amount of fuel consumed.

Another benefit of Transit/TDM is that it can help to improve the quality of life in the community. By providing more options for getting around, Transit/TDM can make it easier for people to get to work, school, and other destinations. This can lead to less stress and more time spent with family and friends. Additionally, Transit/TDM can help to improve the health of the community by encouraging people to walk and bike, which are both healthy forms of exercise.

Transit/TDM is a concept that is still in the early stages of development, but it has the potential to revolutionize the way we think about transportation. By focusing on the needs of the community as a whole, Transit/TDM can help to create a more efficient, sustainable, and healthy transportation system. This is a goal that we should all strive for, and Transit/TDM is a key step in achieving it.

There are many ways to implement Transit/TDM, and the best approach will vary depending on the needs of the community. Some communities may find that the most effective way to implement Transit/TDM is by providing more public transit options, while others may find that bike-sharing or car-sharing is the best solution. The key is to find a solution that works for the community and that encourages people to use it.

Transit/TDM is a concept that is still in the early stages of development, but it has the potential to revolutionize the way we think about transportation. By focusing on the needs of the community as a whole, Transit/TDM can help to create a more efficient, sustainable, and healthy transportation system. This is a goal that we should all strive for, and Transit/TDM is a key step in achieving it.

Transit/TDM is a concept that is still in the early stages of development, but it has the potential to revolutionize the way we think about transportation. By focusing on the needs of the community as a whole, Transit/TDM can help to create a more efficient, sustainable, and healthy transportation system. This is a goal that we should all strive for, and Transit/TDM is a key step in achieving it.

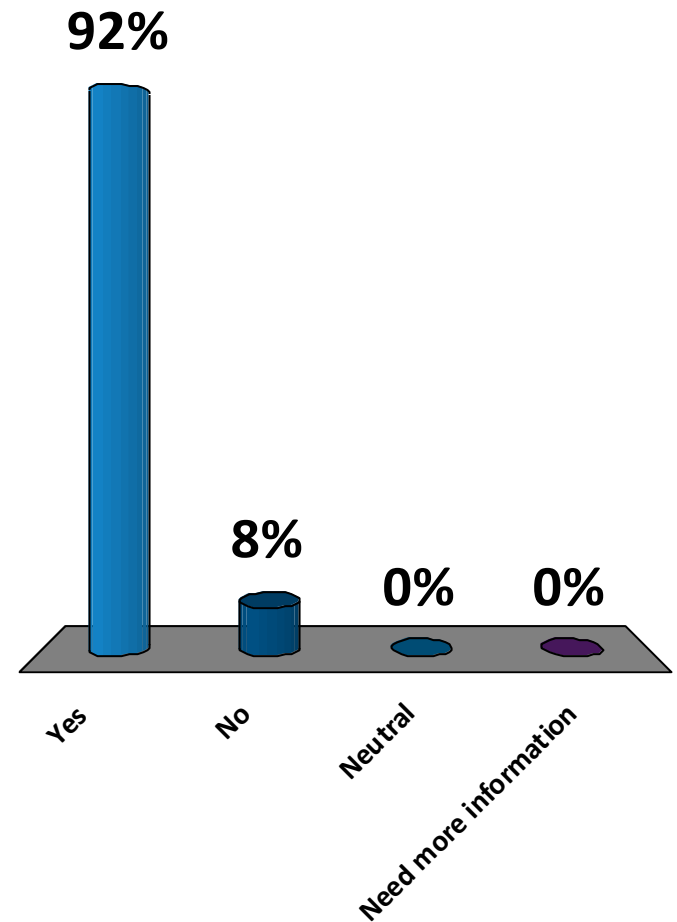
Follow-up Polling: Transit/TDM

Do you agree with the recommendation to **remove** or **limit the use of** each of the following elements from further consideration?

T6: Light Rail Transit

Do you agree with the recommendation to **remove** this element from consideration?

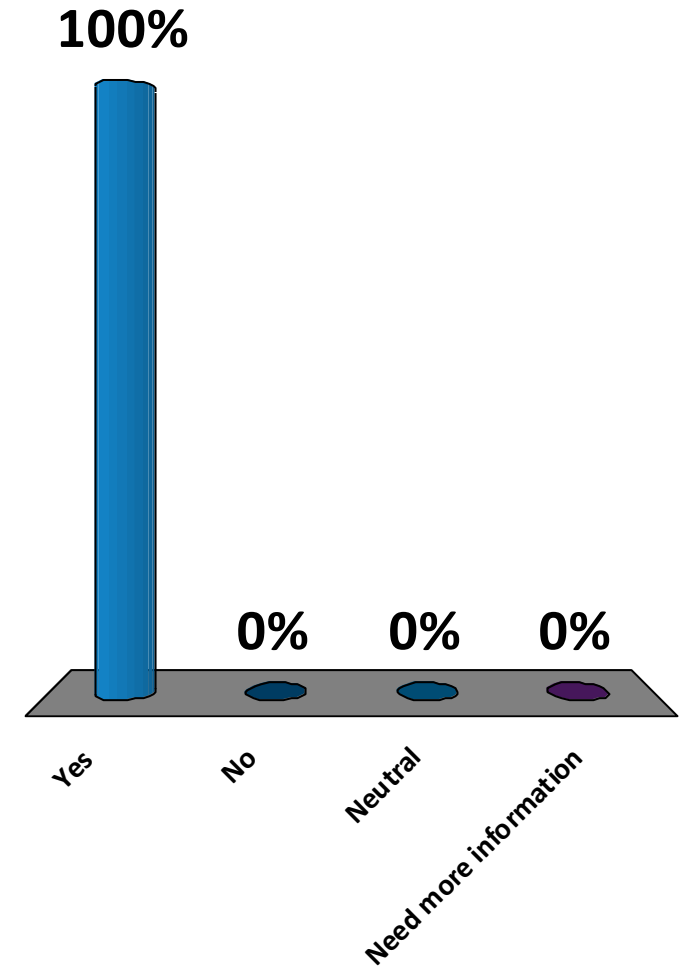
- A. Yes
- B. No
- C. Neutral
- D. Need more information



T12: Reversible Transit Lane

Do you agree with the recommendation to **remove** this element from consideration?

















- A. Yes
- B. No
- C. Neutral
- D. Need more information





VEHICLES AND FREIGHT

Vehicles and Freight

Carried Forward	Limited Use	Eliminated
<p> V1 Three general purpose lanes per direction</p> <p> V2 Two general purpose lanes with one enhanced transit lane in each direction</p> <p> V3 Three general purpose lanes with additional transit lane in each direction</p> <p> V7 Narrower general purpose travel lanes</p> <p> V10 Signal timing adjustments</p> <p> V11 Reduce posted speed limit</p> <p> V12 Access management</p>	<p> V4 Add general purpose lanes on east end of corridor</p>	<p> V5 Reversible traffic lane</p> <p> V6 Wider general purpose lanes</p> <p> V8 HOV Lanes</p> <p> V9 Managed (Express) lanes</p> <p> V13 Roundabout</p> <p> V14 Grade-separated interchange</p> <p> V15 Speed humps</p> <p> V16 Tunnel</p>

Preliminary Response: Vehicles and Freight

Do you agree with the recommendation to **remove** or **limit the use of** each of the following elements from further consideration?

V5: Reversible Traffic Lane

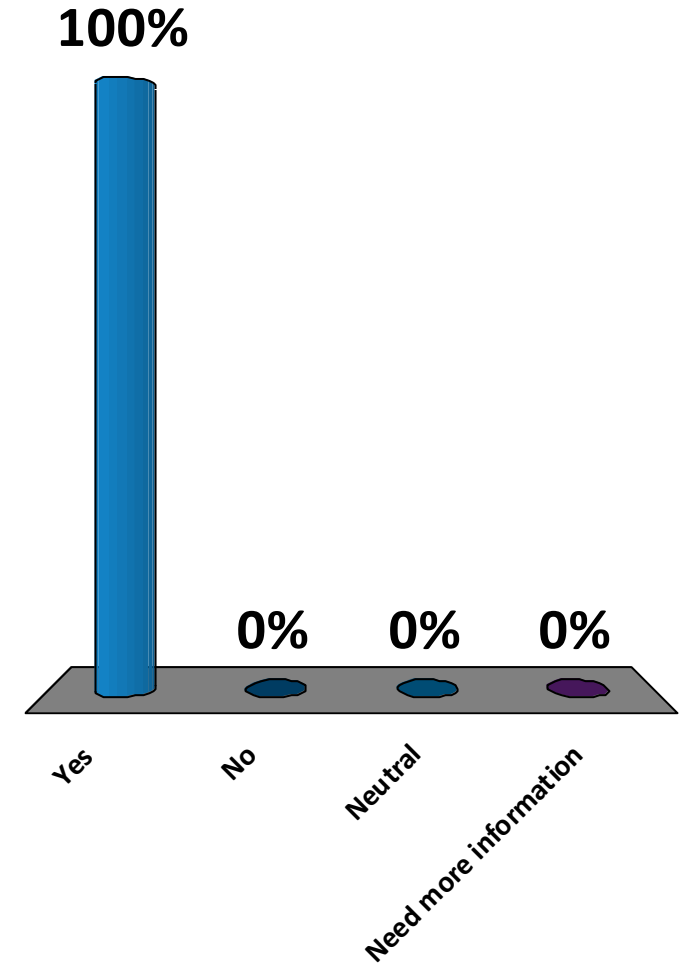


Score	Rationale	Recommendation
✖	Does not allow protected left turn movements; does not address goals to reduce pollution or emission; impacts pedestrian and bicycle crossing comfort	Remove from consideration

V5: Reversible Traffic Lane

Do you agree with the recommendation to **remove** this element from consideration?

- A. Yes
- B. No
- C. Neutral
- D. Need more information



V6: Wider General Purpose Travel Lanes



Score	Rationale	Recommendation
✖	Does not support several TMP goals; would require reducing width of other facilities or acquiring right-of-way; encourages higher speeds	Remove from consideration

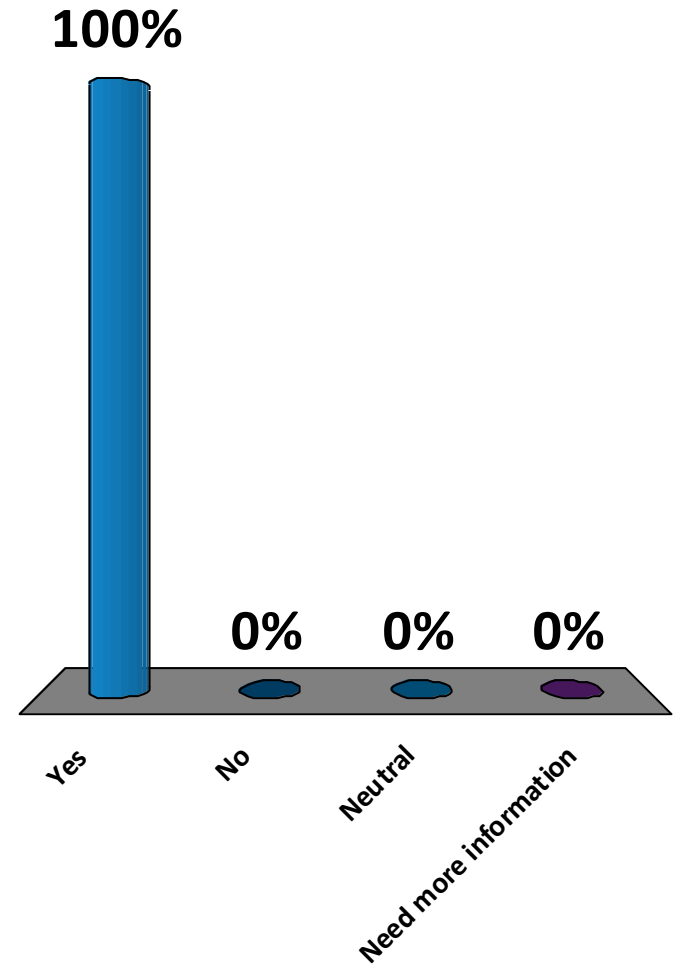
● Feasible or supportive ▲ Challenging, cause for concern, or only appropriate in certain locations

✖ Infeasible, significant impacts, or not supportive

V6: Wider General Purpose Travel Lanes


Do you agree with the recommendation to **remove** this element from consideration?

- A. Yes
- B. No
- C. Neutral
- D. Need more information



V8: High Occupancy Vehicles (HOV) Lanes



Score	Rationale	Recommendation
	Typical for limited-access roadways or highways; frequent intersections and driveways are operational challenges for HOV along Arapahoe	Remove from consideration. Could be considered for specific segments of the corridor.



Feasible or supportive



Challenging, cause for concern, or only appropriate in certain locations



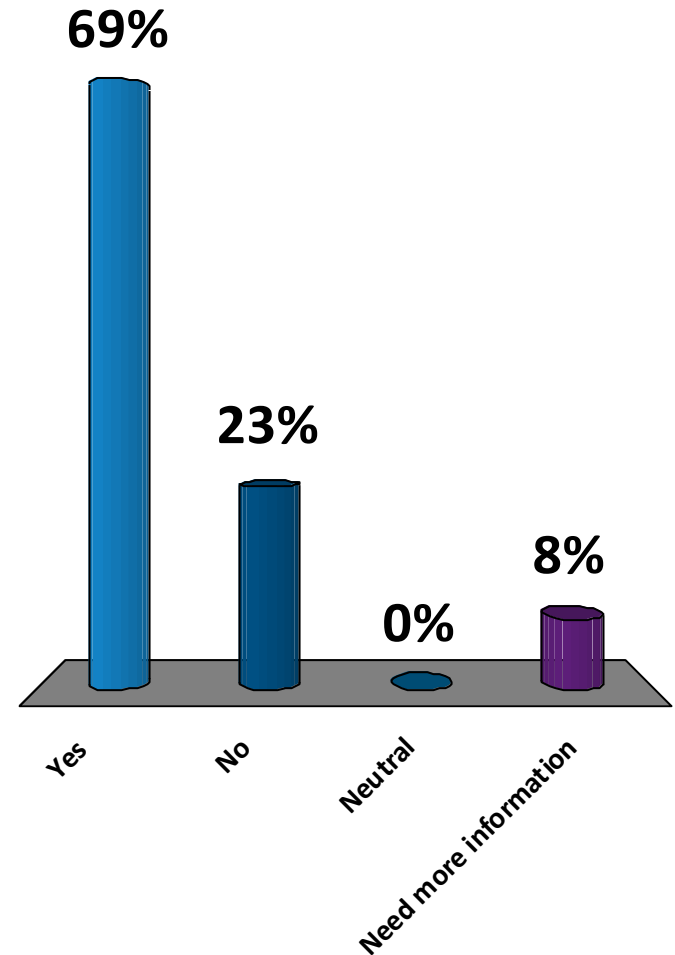
Infeasible, significant impacts, or not supportive

V8: High Occupancy Vehicles (HOV) Lanes

Do you agree with the recommendation to **remove** this element from consideration?

- A. Yes
- B. No
- C. Neutral
- D. Need more information

**Note: No follow-up voting conducted.
To be discussed at future CWG Meeting.**



V9: Managed Lanes (Express Lanes)



Score	Rationale	Recommendation
✖	Would present traffic operation challenges and access concerns at intersections and driveways	Remove from consideration



Feasible or supportive



Challenging, cause for concern, or only appropriate in certain locations

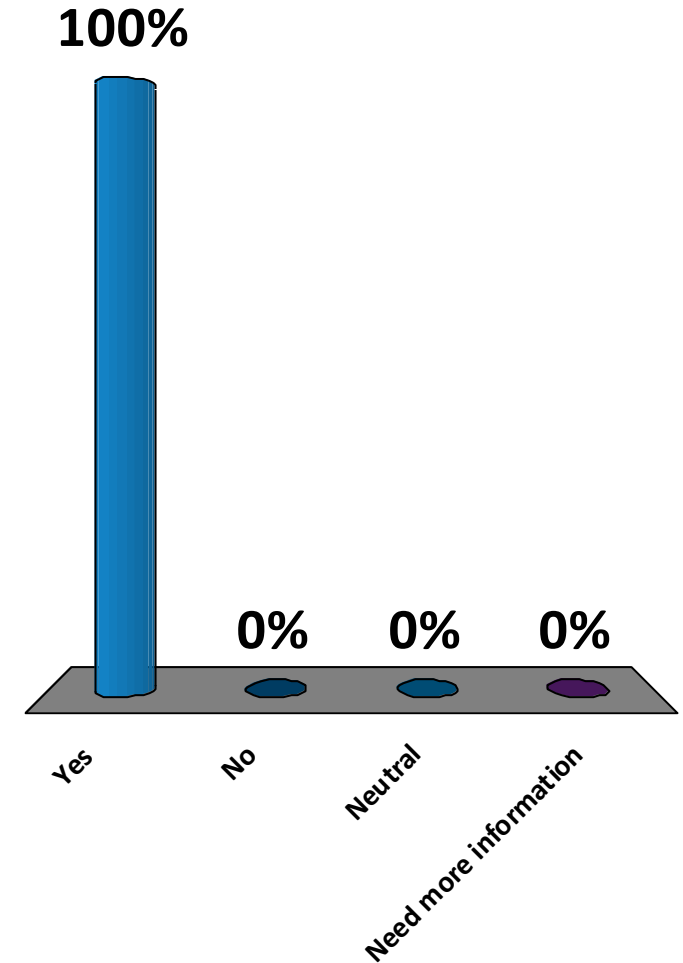


Infeasible, significant impacts, or not supportive

V9: Managed Lanes (Express Lanes)


Do you agree with the recommendation to **remove** this element from consideration?

- A. Yes
- B. No
- C. Neutral
- D. Need more information



V13: Roundabout



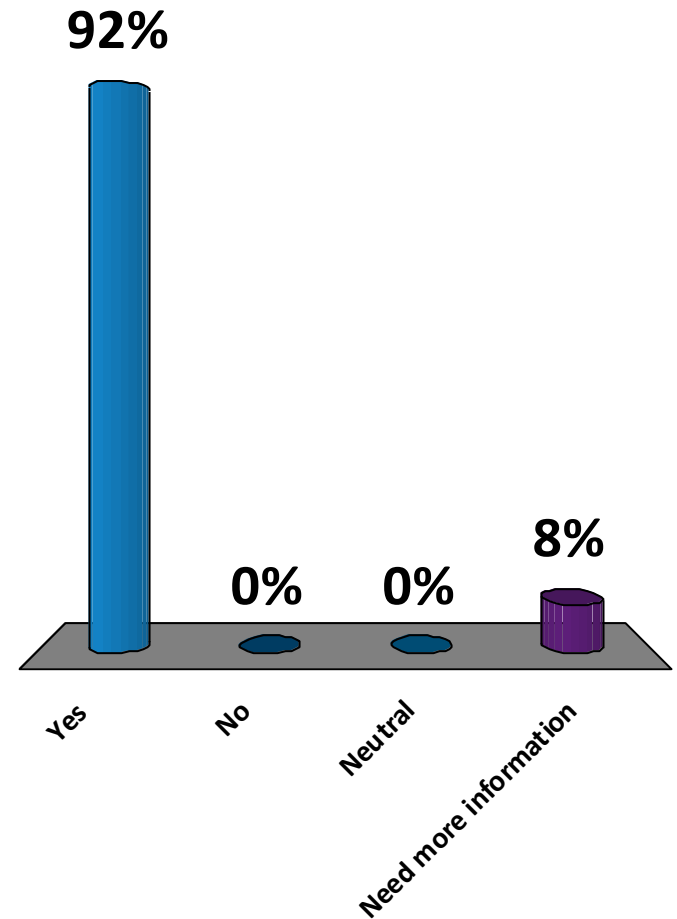
Score	Rationale	Recommendation
	Would require right-of-way acquisition; multi-lane roundabout likely to reduce pedestrian and bicycle comfort and safety	Remove from consideration. May be suitable for select locations, but not advisable for major corridor intersections.

V13: Roundabout

Do you agree with the recommendation to **remove** this element from consideration?

- A. Yes
- B. No
- C. Neutral
- D. Need more information

**Note: No follow-up voting conducted.
To be discussed at future CWG Meeting.**



V14: Grade Separated Interchange



Score	Rationale	Recommendation
✖	Would require significant financial investment; may reduce pedestrian and bicycle access and comfort	Remove from consideration



Feasible or supportive



Challenging, cause for concern, or only appropriate in certain locations



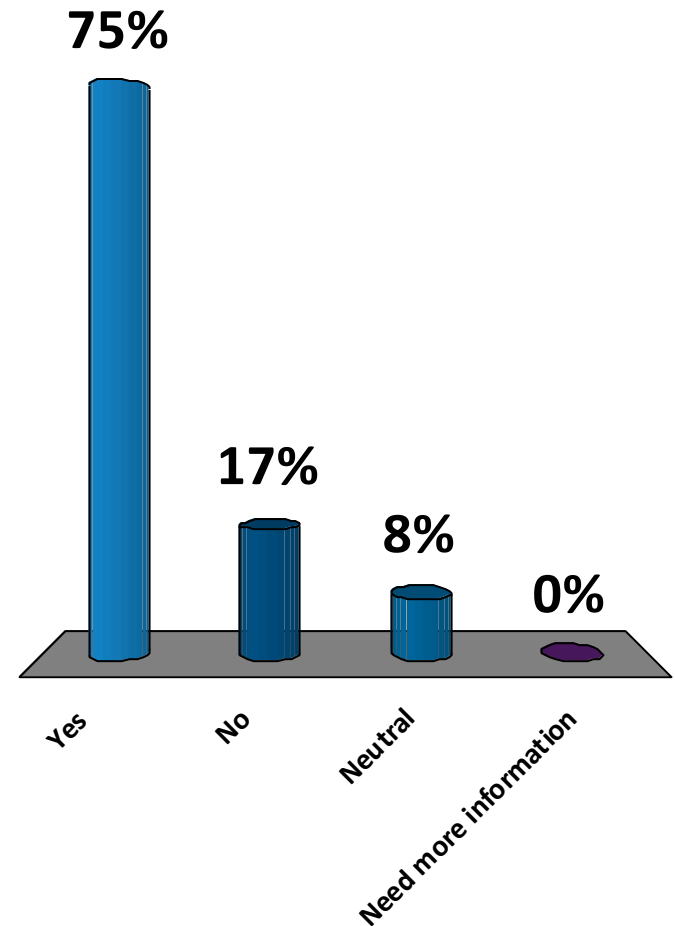
Infeasible, significant impacts, or not supportive

V14: Grade Separated Interchange

Do you agree with the recommendation to **remove** this element from consideration?

- A. Yes
- B. No
- C. Neutral
- D. Need more information

**Note: No follow-up voting conducted.
To be discussed at future CWG Meeting.**



V15: Speed Humps



Score	Rationale	Recommendation
✖	Not compatible with vehicle speeds on Arapahoe; should not be avoided on roads with frequent transit, freight and emergency vehicles	Remove from consideration



Feasible or supportive



Challenging, cause for concern, or only appropriate in certain locations

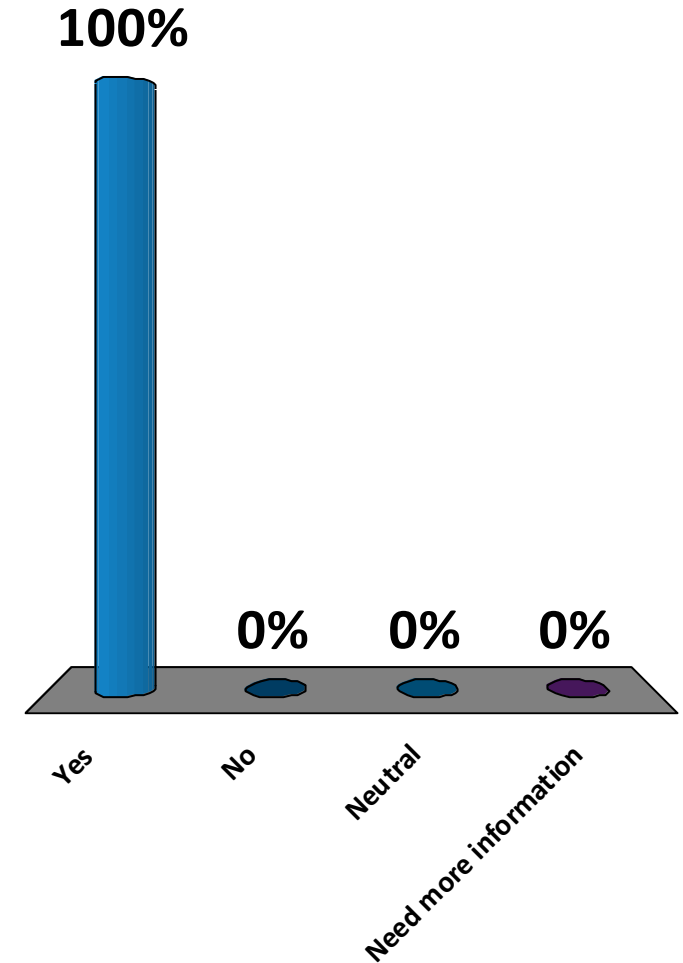


Infeasible, significant impacts, or not supportive

V15: Speed Humps

Do you agree with the recommendation to **remove** this element from consideration?

- A. Yes
- B. No
- C. Neutral
- D. Need more information



V16: Tunnel



Score	Rationale	Recommendation
✖	Would serve longer distance trips; would require significant financial investment	Remove from consideration



Feasible or supportive



Challenging, cause for concern, or only appropriate in certain locations

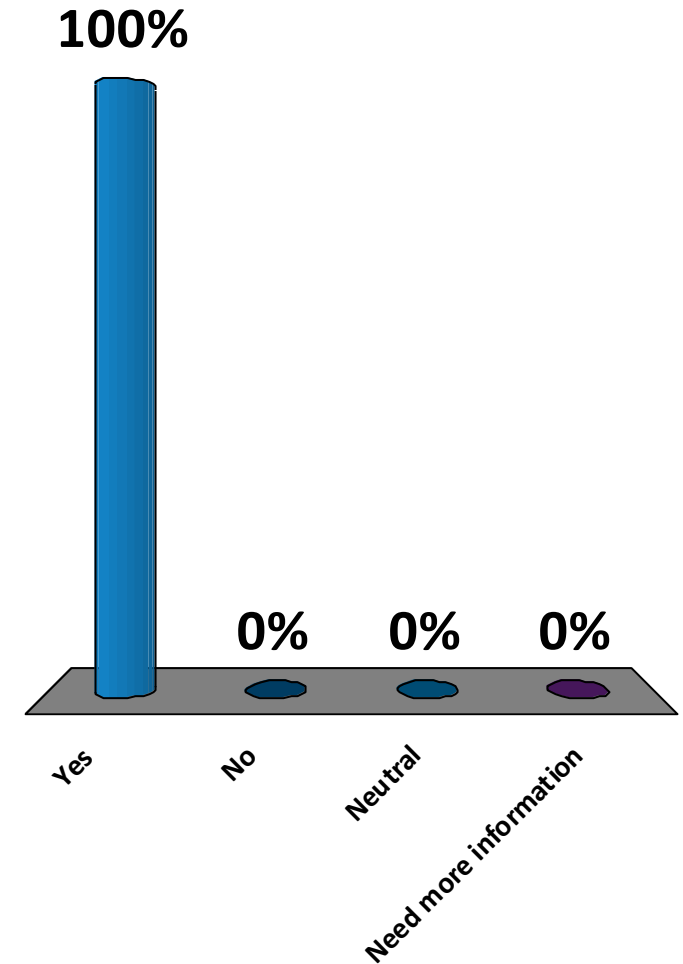


Infeasible, significant impacts, or not supportive

V16: Tunnel

Do you agree with the recommendation to **remove** this element from consideration?

- A. Yes
- B. No
- C. Neutral
- D. Need more information



Discussion: Vehicles and Freight



Debrief

- What worked?
- What would you change?
- What questions would you like addressed in the future?
- Next steps and commitments

Thank You!